WYNNE'S

"INFALLIBLE"

HUNTER METER

The "Infallible"

Exposure Meter Company, Wrexham

THERE is no question that the greatest difficulty a beginner in Photography experiences is in rightly estimating the correct exposure to be given under the varying conditions of **Subject, Stop, Speed of Plate, and Light Value,** and without some guide he is generally hopelessly at sea, very often becomes disheartened at the poorness of his results and the large percentage of his failures, and in consequence throws Photography up in disgust. Many ingenious exposure tables have been prepared, which undoubtedly have rendered some aid in estimating the approximately correct exposure, but the calculations involved have been complicated, and the method of obtaining the Light Value, according to the day and hour of the month, the latitude of the place and by the conditions of

"Sunshine," "Diffused Light," "Dull," and "Gloomy," gives obviously only a very rough approximation to the true Light Value, and for subjects in a shaded position is of no use whatever. Even when Actinometers have been used, the process of deducing the correct plate exposure from the time the Actinometer takes to darken, has been troublesome and complicated, each factor having to be calculated for separately. **In Wynne's "Infallible" Exposure Meters,** by a single movement of a single scale the correct exposure is instantly and simultaneously shown against each stop, from the largest to the smallest.

The four conditions (as before marked) which govern exposure are :—

1—The intensity of the light which illuminates the subject.
2—The Diaphragm or Stop employed.
3—The character of the subject to be photographed.
4—The sensitiveness of the plate used.

1.—The first is determined by the time, in seconds, taken for the sensitive paper in the Actinometer to colour to a standard tint. This in the open varies from about 2 or 3 seconds in brilliant summer light to 2 or 3 minutes at sunrise and sunset, and is called the **Actinometer Time.** In the absence of a Watch having a seconds finger, the Actinometer may be timed by applying the watch to the ear and

counting the number of "ticks" which are usually four or five to the second. If no watch is available a piece of string with a small weight at the end may be used as a pendulum. If the pendulum is 40 inches long it will swing seconds. if 22 inches long $\frac{3}{4}$ seconds, and if 10 inches long $\frac{1}{2}$ seconds. There are two tints in the Actinometer, the darker one or **standard tint** being used for all **ordinary subjects and conditions.**

The lighter one may be used for **interiors, views under trees,** or when the light is very weak and takes minutes to colour the paper to the standard tint. To colour to the lighter tint, it takes only one-fourth of the time necessary for the

sensitive paper to colour to the darker or standard tint and where the light is very weak its use effects a great saving of time. For directions as to the use of the lighter tint see chapter on **interiors**. In judging the tint it is better to hold the meter from 18 inches to 2 feet from the eye, instead of close to.

The old Golden Rule of Photography, **"to expose for the shadows, and let the high lights take care of themselves,"** is a good one to observe; and it therefore follows that the Actinometer should be held so that the light which falls upon it is that which illuminates the darkest portion of the subject in which detail is required to be rendered.

Generally, if the Actinometer is held in the shadow of the body the light value in that position will be the same as if held in the shadow of the subject being photographed. If the painted Tints at any time require adjusting, new Dials, with correct standard Tints, can be had.

To expose a fresh surface of sensitive paper, turn the knurled or milled edge of the revolving metal disc towards the right by pressure of the fingers, a distance equal to one of the radial divisions engraved on the Ivorine disc, when a fresh yellow surface of paper will be seen through the aperture. Then place the hand over it until ready to measure the time it takes to colour to the standard tint as before explained.

When the piece of sensitive paper is being turned to present a new surface for exposure, if the light at the time is very intense there is danger of the paper being discoloured before it can be covered by the hand. This can be obviated by covering the disc with say three of the fingers whilst the movement is being made, thus protecting the sensitive paper from the action of the light.

Where an Orthochromatic Screen is used, the extent to which the exposure is slowed thereby may easily be found by taking the Actinometer Time in the ordinary way and again with the Orthochromatic Screen placed over the exposed portion of the sensitive paper Thus if the screen slows

the Actinometer Time say 2, 3, 4, or 6 times, then the exposure for the negative will be slowed in exactly the corresponding degree.

2.—The diaphragm or stop employed :—

The instrument is marked with the focal values of the diaphragms in common use, the decimal points, however, being omitted for clearness. The diameters of the apertures are factors of the focal length of the lens employed ; thus, with stop $\frac{F}{8}$, $\frac{F}{16}$, and $\frac{F}{32}$, the diameters of the apertures are equal to the focal length of the lens divided by 8, 16, and 32 respectively.

To find the **F** No. of an unknown Stop, draw a line equal the focal length of the lens, and set a pair of

compasses to the exact diameter of the Stop. Then see how many times the diameter will step into the length of the line. If it steps 10 times the No. is $\frac{F}{10}$, if 16 times the No. is $\frac{F}{16}$, if 43 times the No. is $\frac{F}{43}$, and so on.

To find the focal length of a lens, focus an object 50 to 100 yards distant, and (if a single lens) measure the distance from the lens to the ground glass, and (if a doublet) from the diaphragm slot or iris diaphragm to the same.

It is most important that the ratios of the apertures should be accurately known.

Many Snap-Shot and some other Cameras have the Stops marked with the U.S. numbers. The fol-

lowing numbers give the corresponding F numbers:

U.S. 1 = F 4 ; 2 = F 5½ ; 3 = F 7 : 4 = F 8 ; 8 = F 11 ; 12 = F 14 ; 16 = F 16 ; 24 = F 20 ; 32 = F 23 ; 64 = F 32 ; 128 = F 45 ; 256 = F 64.

The top scale is interchangeable so that Scales according to the F, U.S., or any other systems, or specially divided Scales for Autochrome Exposures, can be instantly substituted for one another.

These special scales can be supplied to order.

Spare diaphragms can be quickly made by cutting them out of thin black sheets of celluloid, and enlarging hole to size required with any pointed instrument.

3.—Character of the subject:—

The great majority of Photographs (probably 19

out of 20) are either **Landscape with strong Foregrounds, Buildings, Living Objects out of Doors, views under Trees, Shady Lanes, Copying Photographs, Studio Work or Interiors generally,** and the instrument is primarily constructed for this class of subject. The adaptation of the instrument to other exceptional classes of subjects will be treated further on.

4.—The sensitiveness of the plate :—

Instead of expressing the sensitiveness of a plate by an arbitrary number, it is expressed by the size of diaphragm through which the plate would require the Actinometer time for its correct exposure upon a normal subject. Thus Ilford ordinary Plate, No. F 56, means that an ordinary

subject upon these plates, through Stop F 56, would require the **Actinometer Time** for its correct exposure. Similarly—

Mawson's Photo Mechanical Plates	No. F 20
Wratten's Ordinary Plates	No. F 23
Paget XXXXX Plates	No. F 78
Kodak Film	No. F 90

means that each of these plates would require the **Actinometer Time** for its correct Exposure upon a normal subject through the diaphragm which represents its speed number as above.

If F 45 (which is the **average speed of an ordinary plate**) is placed opposite **1**, then the

comparative speed of any plate will be simultaneously found opposite its diaphragm number, thus:—

	Diaphragm Speed No.	Comparative Speeds.
Barnet Ordinary	F 39 ..	$\frac{3}{4}$
Ilford Empress	F 56 ..	$1\frac{1}{2}$
Imperial Ex Rapid	F 78 ..	3
Paget Special Rapid ..	F 64 ..	2
Paget XXX	F 45 ..	1
Wratten Ordinary	F 23 ..	$\frac{1}{4}$

And so on.

TO CALCULATE THE CORRECT EXPOSURE.

Turn the movable scale on the left hand side of the

Meter by means of the small projecting Knob until the Diaphragm number of the plate or film used (see speed list) is opposite the Actinometer time on the outer scale. Then the correct exposure in seconds and fractions of seconds will be found simultaneously against each Stop from the largest to the smallest; or shortly, you set the one scale, it does the rest.

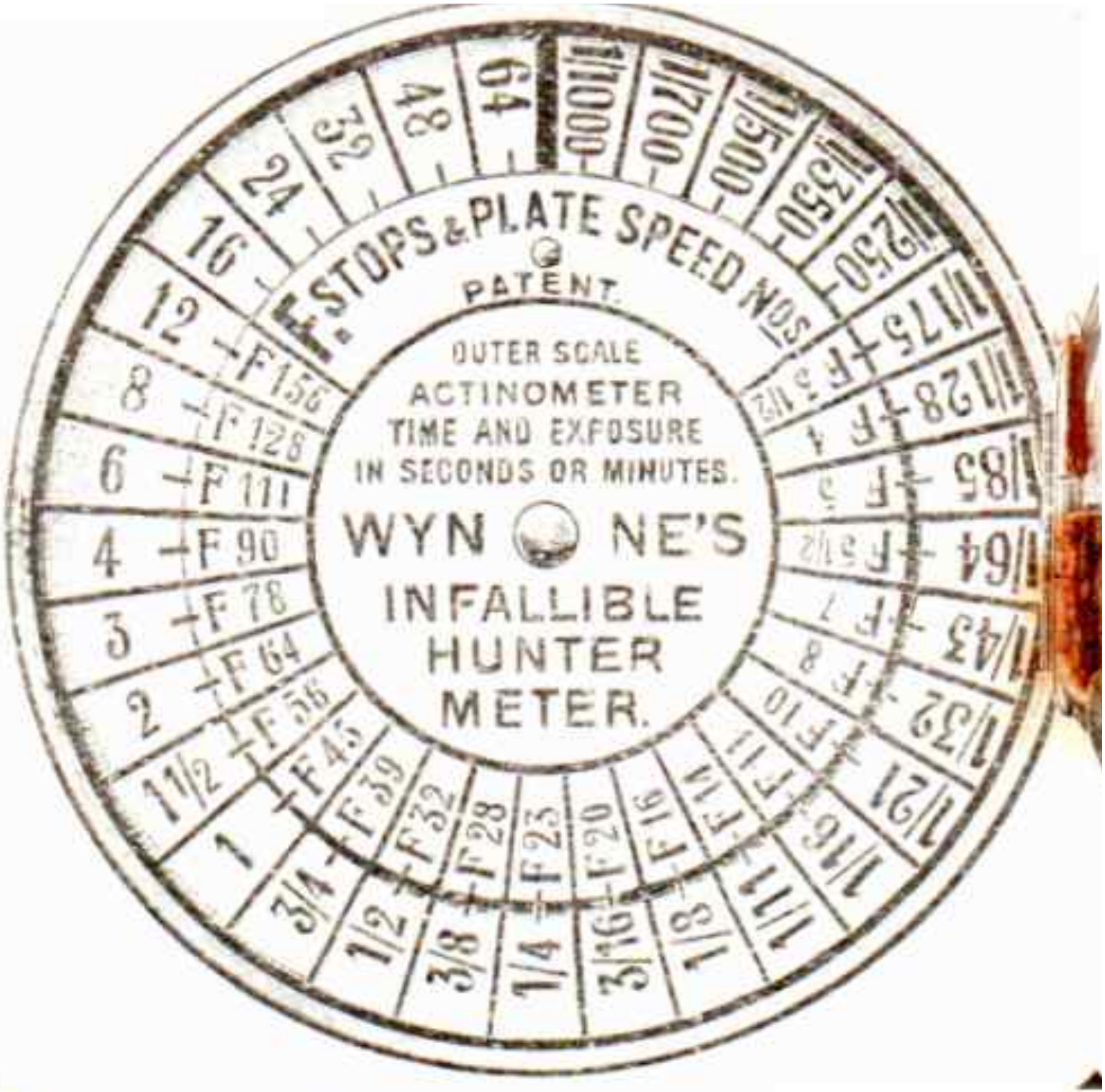
Example No. 1:—Plate Speed No... F 45.
Actinometer.. .. 12 seconds.
Stop .. .. .. F 16.

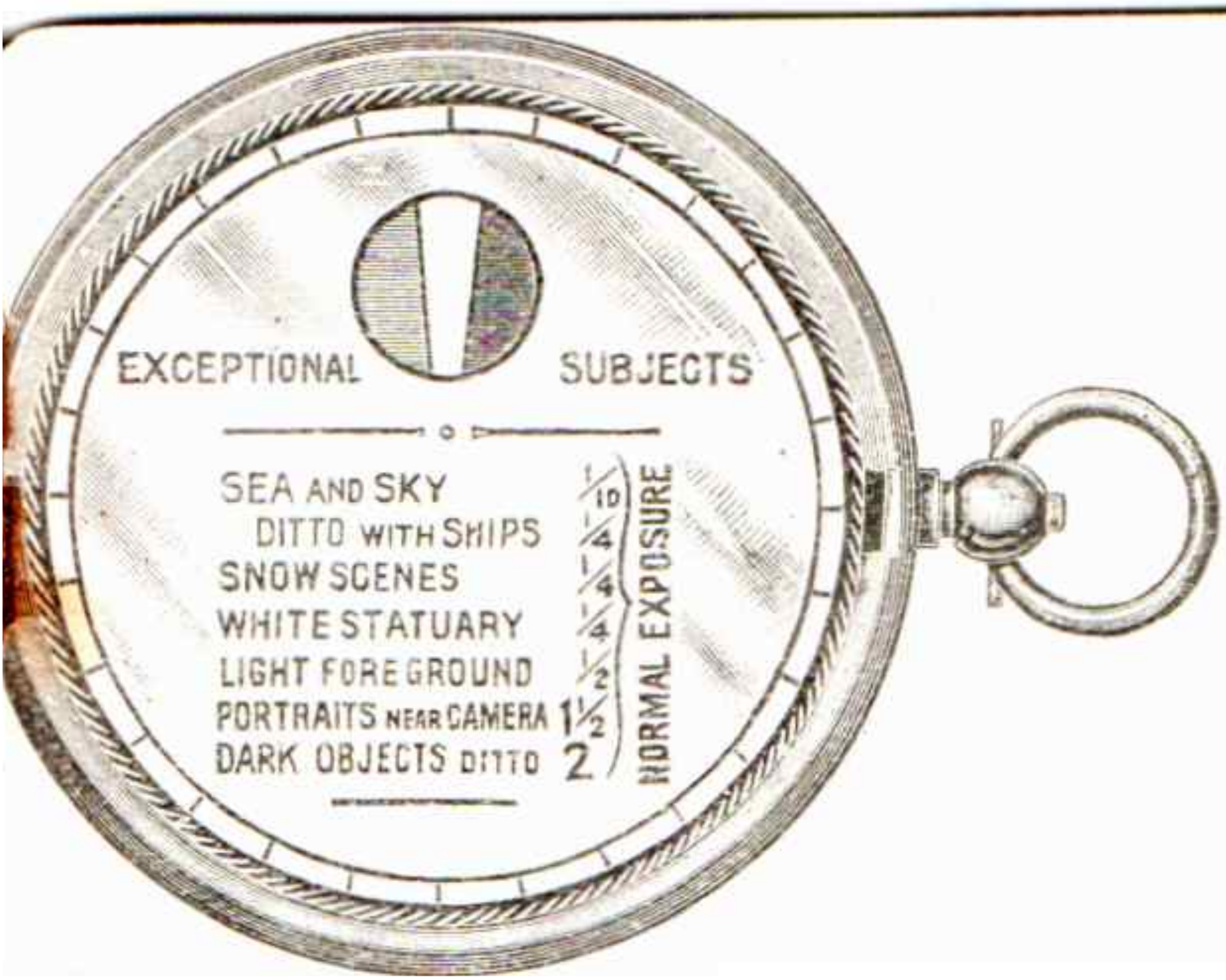
Put **F 45** against **12** seconds, then against **F 16** will be found 1½ seconds, which is the correct exposure, and also against every other Stop the correct exposure for that particular Diaphragm.

Example No. 2:—Plate Speed No. .. F 90
Actinometer .. 3 seconds. Stop .. F 5½.

Put **F 90** against **3** seconds, then against **F 5½** will be found $\frac{1}{85}$ of a second, and also against every other Stop the correct relative exposure. If in an interior exposure or an exposure in a shaded situation the sensitive paper takes minutes instead of seconds to colour to the standard tint, the figures upon the Exposure Scale should also be read as minutes instead of seconds.

When a slow plate Speed is set against a slow actinometer time if any of the Stop divisions extend to the right beyond the thick black line on the outer scale, they must obviously not be read.


F. STOPS & PLATE SPEED NOS
PATENT.
OUTER SCALE
ACTINOMETER
TIME AND EXPOSURE
IN SECONDS OR MINUTES.
WYNNE'S
INFALLIBLE
HUNTER
METER.
64
32
24
16
12
8
6
4
3
2
1½
1
¾
½
⅜
¼
3/16
⅛
1/11
1/16
1/21
1/29
1/43
1/64
1/85
1/128
1/175
1/250
1/350
1/500
1/700
1/1000
F 156
F 128
F 111
F 90
F 78
F 64
F 56
F 45
F 39
F 32
F 28
F 25
F 20
F 16
F 14
F 11
F 10
F 8
F 7
F 5½
F 5
F 4
F 3½


EXCEPTIONAL
SUBJECTS
SEA AND SKY 1/10
DITTO WITH SHIPS 1/4
SNOW SCENES 1/4
WHITE STATUARY 1/4
LIGHT FORE GROUND 1/2
PORTRAITS NEAR CAMERA 1½
DARK OBJECTS DITTO 2
NORMAL EXPOSURE

PHOTOGRAPHING EXCEPTIONAL SUBJECTS.

The foregoing rule gives the exposure for a **normal** subject, but the following exceptional subjects require the variations given below :—

	Divide Normal Exposure by
For Cloud Negatives	12
,, Sea and Sky	10
,, Ditto, with Ships or light foreground	4
,, Copying Engravings, &c., in Black and White	4
,, Snow Scenes, Glaciers, White Statuary	4
,, Extreme distance in open Landscape	4
,, Panoramic Views or open Landscape with no dark objects in foreground	2

	Multiply Normal Exposure by
For Portraits or Groups when at a distance of less than 20 ft. from Camera	$1\frac{1}{2}$
For Dark Coloured objects, Old Oak, Oil Paintings, when at a distance of less than 20 feet from Camera	2

The variations for exceptional subjects will be found engraved on the actinometer disc.

When copying (or where the object Photographed is very near), the camera has to be racked out, and the distance from the lens to the ground glass is then greater than the normal equivalent focus of the lens. If this increased distance is less than $\frac{1}{5}$ of the normal equivalent focus of the lens it may be neglected, but if the distance is increased

To $1\frac{1}{4}$ times, multiply normal exposure by $1\frac{1}{2}$
,, $1\frac{1}{2}$,, ,, ,, ,, ,, 2
,, $1\frac{3}{4}$,, ,, ,, ,, ,, 3
,, 2 ,, ,, ,, ,, ,, 4

Good Negatives of Black and White Engravings are much more easily obtained upon Photo Mechanical than upon ordinary Plates.

PLATE SPEED NUMBERS.

The list of plate speed numbers is the result of actual camera tests, *but as the speeds of different batches of plates by the same makers vary considerably*, they must only be taken as a guide. A good plan for a first trial is to make two exposures of the same subject, setting the Actinometer

time for one at the number next above the plate speed given, and for the other at the number next below that speed. A comparison of the resulting negatives will then show which is the nearer to the correct exposure, and when once the actual speed which gives the best result is ascertained, a note should be made of it for future use. The list being constantly revised is printed on a separate card.

INSTANTANEOUS PHOTOGRAPHS.

If the speed of the shutter in fractions of a second is known, the instrument will show at a glance on Time Scale what Stop should be used to give the correct exposure, or whether under the conditions of

light at the time it is possible to give sufficient exposure. For instantaneous photographs, if it is found absolutely necessary, the Actinometer time may be set one, or two, plate speed numbers higher than would be calculated for time exposures; but if after doing this the instrument shows that the speed of the shutter is still too quick to give sufficient exposure with the largest stop, it may be concluded that it is useless to attempt an exposure, which would only result in failure through under exposure.

The secret of successful exposures in instantaneous photography is :—

Firstly—to use a Rapid Plate and lens, capable where necessary of working with a large aperture, not less than F 8.

Secondly—to use a Reliable Shutter.

Thirdly—to use the shutter at the lowest speed the subject will allow.

Fourthly—to use the shutter whenever possible at a **constant speed**, and regulate the variations of exposure by the size of Stop used. The variations of exposure due to the sizes of Stops can be calculated for exactly, but the variations of the speed of a shutter cannot be so determined without a special test.

Fifthly (and most important)—to use an **"Infallible" Exposure Meter**, which will

show at a glance the proper Stop to use under all conditions.

If the slowest speed of shutter is say $\frac{1}{16}$ of a second the Exposure Meter will show at a glance what Stop corresponds with that speed for any set of conditions.

INTERIORS.

In photographing Interiors the best method to pursue is to employ a Stop of the same size as the Diaphragm number of the plate used, and uncap the Lens and the Actinometer at the same time, placing the Actinometer in the darkest part *where detail is required*, but with the sensitive paper turned towards the light which illuminates this part. When the Actinometer has darkened to the standard tint, re-cap the Lens.

If the light is poor and time is an object, the exposure can be expedited by using the lighter tint, of the Actinometer instead of the darker one. As, however, it takes only one fourth of the time to colour to this tint, a Stop four times as large or four numbers lower than the plate speed diaphragm must be employed—the lens being re-capped when the lighter tint is reached, as before explained.

The lighter tint may be used at any time and for any **subject** if the speed of the plate be calculated as four numbers lower than the diaphragm number given. Thus, instead of calculating Paget XXXXX, XXX and XX Plates as F 78, F 45, and F 32, they must be calculated as F 39, F 23, and

F 16, respectively. To avoid complications, however, it is recommended only to use it when the light is very weak.

ENLARGEMENTS.

In making daylight enlargements the best plan is to *always use* the same Brand of Plate or Bromide Paper and the same stop in the Lens used for enlarging. This only leaves the two factors of **Light** and the **printing quality of the negative** to be taken into consideration

The actinic value of the light is easily tested by the actinometer as before explained and the **printing quality of the negative** then only remains to be allowed for.

The simplest method of procedure is to once ascertain by trial the time of correct exposure of an enlargement from a particular negative, and also the Actinometer Time during the Exposure and to mark the Negative with both these Times. Thus suppose the Actinometer Time was 8 seconds and the Time of Exposure 16 seconds the negative should be marked on the edge thus :—

$$\frac{16 \text{ Exposure}}{8 \text{ Actinometer}}$$

If then the Time of Exposure 16 seconds be divided by the Actinometer Time 8 seconds, the result equals 2. This shows that for that particular Negative the exposure for **similar enlarge-**

ments will always be twice the Actinometer Time whatever the latter may be. To take a few other examples.

No.			Correct Exposure equals
1	Exposure	4	$\frac{1}{3}$
	Actinometer	12	
2	Exposure	3	$\frac{3}{4}$
	Actinometer	4	
3	Exposure	8	$\frac{1}{2}$
	Actinometer	16	
4	Exposure	16	$\frac{2}{3}$
	Actinometer	24	
5	Exposure	8	2
	Actinometer	4	
6	Exposure	15	$2\frac{1}{2}$
	Actinometer	6	

Actinometer Time.

After a few Negatives have been tested and marked, on comparing any new Negative with one of these a very close approximation to its printing quality can be estimated and the correct Exposure given without the necessity of making a special test Exposure. The Meter should be held close to the side of the negative so that the light which falls upon it is of the same intensity as that which illuminates the negative being enlarged.

SIMPLICITY OF INSTRUMENT.

It will be seen from the foregoing description that the simplicity of the instrument is not attained by ignoring any of the factors of exposure, but by the scales being so designed that each of them

represents in itself two or three of these factors.

Thus :— The scale of Diaphragms represents— Firstly, **The Scale of Diaphragms,** and secondly **The Speed of Plate;** while the Time Scale represents the **Actinometer Time** and also the **Exposure** in seconds or minutes.

The scales are also so divided and arranged that when they are set correctly for one Diaphragm they are simultaneously set correctly for every Diaphragm from the largest to the smallest.

The system of plate speed numbers, the design and arrangement of scales and of the instrument generally, are Protected by the Copyright and Patent Laws, and the advantages arising therefrom are not and cannot be shared by any other system.

DIRECTIONS AS TO USE OF METER.

The Case is divided into two parts which are hinged together, and opens automatically by pressure on the small knob on the pendant. On the left hand side of the open case are the two Scales for the calculation of the Exposure. These scales are beautifully engraved on polished White Ivorine. The top scale of Stops and Plate Speed Numbers snaps on to and revolves on a centre pin, and can be turned and set in any position. The bottom or outer scale carrying the Actinometer Time and Exposures in Seconds or Minutes is fixed to the bottom of the Case.

On the right hand side of the open case is the Actinometer with Standard Tints and Sensitive Paper. The variations for "Exceptional Subjects" are engraved on polished White Ivorine, and fitted into the Metal disc.

The used piece of sensitive paper can be removed and a new one substituted by turning the knurled metal disc until the taper Slot is exactly opposite to the centre of the hinge. The

two small projecting points on the rim of the disc will then be opposite the slots in the case at the hinge and Snap. The disc can then be lifted out of the case, the projecting points coming through the two opposite slots and replaced by reversing the operation. In order to prevent the sensitive paper from turning round, one corner should first be placed under the tapered end of the spring near the hinge. If the actinometer dial is then turned from left to right it will tend to tighten this piece of sensitive paper. The operation of changing the piece of sensitive paper should be carried out in a subdued light in a room or by gas or lamp light.

The Hunter Meter has been specially designed to attain the maximum of simplicity, convenience and efficiency, with the minimum diameter and thickness of case. The Case is only one quarter of an inch in thickness when closed.

If at any time you have the least difficulty, or do not clearly understand any point, please communicate with us (enclosing stamped addressed envelope) and we will put you right.

(Actual thickness).

The *"Infallible" Exposure Meter* is an Infallible and Instantaneous Guide to Correct Exposure under all Conditions :—

From the Poles to the Equator.
,, Sunrise to Sunset
,, Brilliant Sunlight to Fog.
For Instantaneous or Prolonged Time Exposures
,, Open Landscape or Dense Woodland.
,, Photographic Studio or Dimly Lighted Interior.
,, Copying or Enlarging.
,, The most rapid or the Slowest Plates.
And with all Diaphragms, from the largest to the smallest.

Correct Exposure found Simultaneously for every stop by the simple movement of the one Scale.